

KOROVITSYN, V.P.; SAUSHKIN, Yu.G. prof.

Socioeconomic maps of aggregate regional atlases. Vest. Mosk.
un. Ser. 5: Geog. 20 no.6:3-16 N-D '65.

(MIRA 19:1)

1. Kafedra ekonomicheskoy geografii SSSR Moskovskogo universiteta.
Submitted September 13, 1965.

Journal eksperimental'noj teoreticheskoy fiziki, 1965
v. 43, no. 1, p. 101, 1965, and top half
of insert A at rear of journal

TOPIC TAGS: laser, laser resonator, resonator mode, mode selection,
resonator configuration, diffraction loss, resonator loss, confocal
laser, He-Ne laser, gas laser

A method for selecting the resonator modes is suitable for
use based on the choice of a resonator configuration. The dif-
ference in the fundamental mode and the first-order off-
resonated resonator consists of changing the refractive
index n of curvature R (number of turns N , $R = N \cdot \pi / n$). At
the same time the diffraction loss is equivalent to a loss of energy. The
advantages of such a resonator are natural.

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VIS 21148

nel number, which can be reduced considerably through reduction of L. Thus, when L is sufficiently comparable to R, a fundamental mode is substantially dominant in a set of modes in a single-mode laser oscillator. This above was confirmed experimentally in the CO₂-neon laser using the 110 mm lens and a 100 cm resonator length at 1.06 and 1.15 μ , respectively, with a maximum power of 4.5 W.

The effect of excited modes (Q) on the resonator length was investigated. The results are shown in Fig. 1 of the figures, where the ratio of multimode generation (K) to single-mode generation (M) is plotted. The ratio K/M increases with Q.

maximum and in this case was 4 MW and 2.5 MW at 1.15 μ and 0.63 μ , respectively. The single-mode generation ensures a narrow directivity pattern, the width of which corresponds to the diffraction range. It has been investigated from the plane mirror side, and the beam in the focal plane of the lens is shown in Fig. 2. The maximum value of the beam intensity is 0.880. This gives the patterns for a multimode oscillation (curve 1), $K/M = 0.880$.

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fundamental mode oscillations (curves 2 and 4, $\omega = 6,275$
, respectively). The computed and experimental values of
the pattern width are in a good agreement. [ref. 3, fig. 1, page 1 figures,
(YK)]

Not done

COMMITTEE

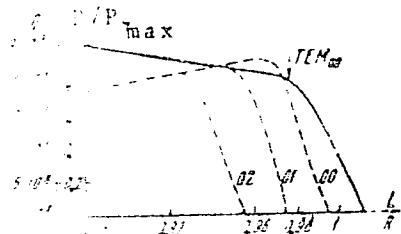
ENGINEERING

TECHNICAL

STAFF POSITION: ENGINEER, DESIGN, ANALYST

REF ID: A648

MAY 20 1981 01



Dependence of laser output and number of modes in resonator

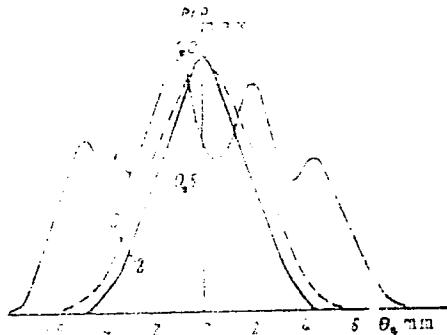


Fig. 2. Directivity patterns for a multimode oscillation and two single-mode oscillations

Card 4 / 4

KOROVITSIN, S.A.

Attachment for cutting packing gaskets. Inform.tekh.sbor.no.1:
44-46 '54. (MLRA 9:7)

1. Kalininskiy vagonostroitel'nyy zavod.
(Gaskets) (Drilling and boring machinery--Attachments)

KOROVITSYN, V. P.

KOROVITSYN, V. P. Raboty v oblasti ekonomicheskoi kartografii. (Moscow, Universitet. Uchenye zapiski, 1940. no. 55, IUbileinaia seria, Geografiia. p. 155-160). DLC:Q60.M868

SO: LC, Soviet Geography, Part I, 1951, Uncl.

BURENSTAM, A.G.; NIKOL'SKIY, I.V.; KOROVITSYN, V.P.; KHRUSHCHEV, A.T.;
SHAPOSHNIKOV, A.S.

Geographical study of the construction industry of the U.S.S.R.
Geog. i khos. no.1:7-11 '58. (MIRA 12:1)
(Construction industry)

IVANOV, S.P., KOROVITSYN, V.P., NIKOL'SKIY, I.V., KHRUSHCHEV, A.T.

Comprehensive studies of the economic geography of Eastern
Kazakhstan. Vest. Mosk. un. Ser.5: Geog. 15 no.3:42-47 My -
Je '60. (MIRA 13:?)

1. Kafedra ekonomicheskoy geografii SSSR Moskovskogo
universiteta. (Kazakhstan--Economic conditions)

KOROVITSYN, V.P.; NIKOL'SKIY, I.V.; RAKITNIKOV, A.N.

Nikolai Nikolaevich Baranski; on his 80th birthday. Izv. Vses.
geog. ob-shva 93 no.4:292-296 Jl - Ag '61. (MIRA 14:7)
(Baranskii, Nikolai Nikolaevich, 1881 -)

KOROVITSYN, V.P.

Map of the development of the urban settlement system in the U.S.S.R.
in 1926-1959. Vest. Mosk. un. Ser. 5: geog. 16 no.6:18-24 N-D
'61. (MIRA 14:11)

1. Kafedra ekonomicheskoy geografii SSSR Moskovskogo universiteta.
(Cities and towns--Maps)

IVANOV, S.P.; KOROVITSYN, V.P.; NIKOL'SKIY, I.V.; KHRUSHCHEV, A.T.

Territorial organization of the construction industry based on
the study of the Kazakh S.S.R. Geog. i khoz. no.9:34-37 '61.
(MIRA 14:11)

(Kazakhstan—Construction industry)
(Kazakhstan—Building materials industry)

KOROVITSYN, V.P.

Exhibition devoted to the First Interdepartmental Scientific Conference on the Geography of population; January 30 to February 3, 1962. Vest.Mosk.un.Ser.5: Geog. 17 no.3:69 My-Je '62.
(MIRA 15:8)

(Russia—Population—Exhibitions)

KOROVITSYNA, I.K.; YUR'YEV, Yu.E.; CHIBURKOV, Yu.A.; LUKINA, Ye.M.

3,4-diketones of the furanidine series and bispirane type in the
synthesis of condensed heterocyclic systems. Zhur. ob. khim. 26
no.7:2058-2063 Jl '56. (MIRA 9:10)

1. Moskovskiy gosudarstvennyy universitet.
(Ketones)

KOROVKEVICH, N.V.

New work methods for securing train traffic safety. Zhel.dor.
transp. 44 no.1:77-79 Ja '62.
(MIRA 14:12)

1. Nachal'nik operativno-rasporyaditel'nogo otdela Glavnogo
upravleniya dvizheniya Ministerstva putey soobshcheniya.
(Railroads--Safety measures)
(Railroads--Traffic)

UMRIKHIN, N.G.; KOROVKEVICH, N.V., inzh., retsentsent; MANYUKOV,
G.S., inzh., red.

[Experience in high-speed freight train traffic; from the
practices of the Southern Ural Railroad] Opyt skorostnogo
prodvizheniya gruzovykh poezdov; iz praktiki IZhno-Ural'-
skoi dorogi. Moskva, Transport, 1964. 61 p. (MIRA 17:3)

MAKAYEV, F.K.; VIGDERGAUZ, Ye.M.; GRUSHEVSKIY, F.U.; KOROVKEVICH,
N.V., inzh., red.; VOROB'YEVA, L.V., tekhn. red.

[Experience in the operative planning of train operations;
from the practices of the Western Siberia Line] Opyt ope-
rativnogo planirovaniia poezdnoi raboty; iz praktiki
Zapadno-Sibirskoi dorogi. Moskva, Transzhelizdat, 1963.
44 p. (MIRA 17:2)

KOROVKEVICH, Nikolay Vladimirovich; PAPKOV, A.A., red.

[Guarding the safety of railroad traffic; from the work practice of traffic department employees] Na strazhe bezopasnosti dvizheniya poezdov; iz opyta raboty dvizhentsel'nykh seti. Moskva, Transport, 1965. 28 p. (MIRA 18:12)

PORADNYA, A.I., doktor tekhn. nauk, prof., retsenzent; VETROV, P.G.,
inzh., retsenzent; GUR'YEV, O.I., kand. arkh. red.;
KOROVKEVICH, V.V., inzh., red.; REYZ, M.B., red.izd-va;
PUL'KINA, Ye.A., tekhn. red.

[Apartment houses made of cellular concrete] Zhilye doma iz
iacheistogo betona; sbornik nauchnykh trudov. Leningrad,
Gosstroizdat, 1963. 235 p. (MIRA 16:12)

1. Akademiya stroitel'stva i arkhitektury SSSR. Leningradskiy
filial.

(Concrete construction) (Apartment houses)

PITLYUK, D.A., inzh.; KOROVKINICH, V.V., inzh.

Hinged cantilever ceilings. Biul.tekh.inform.po stroi. 5
no.9:15-17 S '59. (MIRA 12:12)
(Girders)

VASIL'KOVSKIY, S.V.; BELYAT, B.S., arkitektor; KOROVKEVICH, V.V.,
inzh.

Houses of a new design. Biul.tekh.inform.po stroi. 5
no.10:5-9 O '59. (MIRA 13:3)

1. Chlen-korrespondent Akademii stroitel'stva i arkhitektury
(for Vasil'kovskiy).
(Apartment houses) (Precast concrete construction)

KOROVKIN, A.

The decision of the government on the survey of standard staffs
is not being carried out. Fin. SSSR 17 no.9:27-31 8 '56.
(MLRA 9:10)

(Industrial organization) (Russia--Executive departments)

KOROVKIN, A., slesar'.

Overhead jack for changing spring bushings. Avt. transp. 32 no.1:
36 Ja '54.

(MILIA 7:8)

(Lifting jacks) (Automobiles--Springs)

BYCHKOV, A.G.; KOROVKIN, A.G.

Diametral fans. Prom.aerodin. no.24:110-124 '62. (MIRA 16:7)
(Fans, Mechanical)

KOROVKIN, A.P.

KOROVKIN, A.P., kandidat tekhnicheskikh nauk

Calculating prestressed reinforced concrete elements with bar
reinforcements. Tekh.zhel.dor.7 no.6:9-12 Je'48.
(Prestressed concrete) (MLRA 8:11)

KOLOVSKIY, A. F.

35424. Mosty Iz Predvaritel'no Napryazheanno Zhelezobetona. Trudy IV Vsesoyuz.
Kont-tsii Po Betonu I Zhelezobeton. Konstruktsiyam. Ch. 1. M.-L., 1949, S. 108-17

SO: Letopis' Zhurnal'nykh Statey Vol. 34, Moskva, 1949

KOROVKIN, A.P.

Role of the water factor in transmitting infection in the
epidemiology of acute intestinal diseases. Zdrav.Tadzh. 9 no.5:
19-21 '62. (MIRA 15:12)

1. Iz Regarskoy rayonnoy sanitarno-epidemiologicheskoy stantsii.
(REGAR--INTESTINES--DISEASES) (WATER--POLLUTION)

KOROVKIN, B.F., kand.med.nauk, podpolkovnik meditsinskoy sluzhby; BELOV, N.A.,
kand. med. nauk, podpolkovnik meditsinskoy sluzhby; KANTOROVICH, A.S.

Diagnostic value of transaminase and aldolase in the blood serum in
acute coronary insufficiency. Voen.-med. zhur. no.5: 30-33 My '60.

(MIRA 13:7)

(CORONARY VESSELS—DISEASES)
(ALDOLASE)

(TRANSAMINASE)

KOROVKIN, B.P.; BLOV, N.A.; KANTOROVICH, A.S.

Problem of early diagnosis in acute myocardial infarct. Lab.delo 6
no.1:3-7 Ja-Ye '60. (MIRA 13:4)

1. Iz Leningradskogo okrushnogo voyennogo gospitalya (nachal'nik
H.S. Sokolov). (HEART--INFARCTION) (ENZYMES)

KOROVKIN, B.F.; KANTOROVICH, A.S.

Fast method for semi-quantitative determination of sugar in the
urine. Lab. delo 7 no10;17 0 '61. (MIRA 14:10)
(URINE—ANALYSIS AND PATHOLOGY)

KOROVKIN, B.F., kand.med.nauk; PASHENIN, P.M.; SHALUNOV, S.V.

Diagnostic value of the determination of C-reactive protein in acute coronary insufficiency. Sov.med. 24 no.12:94-98 D '60.

(MIRA 14:3)

1. Iz Leningradskogo okruzhnogo voyennogo gospitalya (nachal'nik N.S.Sokolov) i kafedry mikrobiologii (nachal'nik - prof. A.A. Sinitskiy) Voyenno-meditsinskoy ordena Lenina akademii imeni S.M. Kirova.

(CORONARY HEART DISEASE) (BLOOD PROTEINS)

KOROVKIN, B.F.; YESHINA, Ye.F.; PREDTECHENSKIY, A.N.

Colorimetric method of determining serum lactic dehydrogenase
(lactate dehydrogenase) and its use in clinical practice. Lab.
delo 9 no.3:17-20 Mr '63. (MIRA 16:4)

1. Leningradskiy okruzhnoy voyennyy gospital' (nachal'nik -
polkovnik meditsinskoy sluzhby K.A. Novikov).
(COLORIMETRY) (LACTIC DEHYDROGENASE)

MIKHAYLOVA, Nadezhda Danilovna; KOROVKIN, B.F., red.; BUGROVA, T.I.,
tekhn. red.

[Manual for coprological studies] Posobie po koprologicheskim
issledovaniiam. Leningrad, Medgiz, 1962. 145 p. (MIRA 16:2)
(FECES—ANALYSIS)

KOLOTOLOVA, A.I.; KOROVKIN, B.F.; LYZLOVA, S.N.; VAGNER, V.K.; VASELENKO,
E.T.; DZUTSOV, N.K.

Free ribonucleotides and the activity of some enzymes of the
pentose phosphate cycle in the heart muscle in experimental
myocardial infarction. Biokhimia 28 no.1:113-121 Ja-F '63.
(MIRA 16:4)

1. Chair of Biochemistry, State University, and Biochemical
Laboratory, District Military Hospital, Leningrad.
(HEART--INFARCTION) (NUCLEOTIDES)
(PENTOSE PHOSPHATES)

VAGNER, V.K.; KOLOTILOVA, A.I.; KOROVKIN, B.F.

Blood serum transketolase reaction in myocardial infarct. Vop.med.khim.
10 no.2:158-163 Mr-Ap '64. (MIRA 18:1)

1. Chair of Biochemistry of the A.A.Zhdanov State University Leningrad.

KOROVKIN, Boris Fedorovich; IVANOV, I.I., prof., red.; SHAROBAYKO,
V.I., red.

[Enzymes in the diagnosis of myocardial infarct] Fermenty
v diagnostike infarkta miokarda. Leningrad, Meditsina,
1965. 127 p.
(NIRA 18:4)

1. Chlen-korrespondent AMN SSSR (for Ivanov).

IVANOV, I.I.; KOROVKIN, B.F.; MARKOV, I.M.; CHERNIYENKO, I.S.

Change in the enzymic activity of sarcoplasmatic proteins of
heart muscle in experimental myocardial infarction. Ukr.biokhim.zhur.
37 no.5:712-720 '65. (MIRA 18:10)

1. Kafedra biokhimii Vojenno-meditsinskoy ordena Lenina akademii
imeni S.M. Kirova.

KOLOTILOVA, A.I.; LYZLOVA, S.N.; VAGNER, V.K.; KOROVKIN, B.F.

Some biochemical changes in the myocardium and the blood
at an early stage of experimental myocardial infarct.
Vop.med.khim. 11 no.5:70-74 S-0 '65.

(MIRA 1981)

1. Leningradskiy gosudarstvennyy universitet imeni A.A.Zhdanova.
Submitted May 25, 1964.

KOROVKIN, D.

Let us mark occasion of the party congress by production achievements.
Sov. profsoiuzy 17 no.5:15-16 Mr '61. (MIRA 14:2)

1. Predsedatel' rabochkoma sovkhosa "Reya," Zhitomirskaya oblast'.
(Zhitomir Province—Socialist competition)
(State farms)

L 36145-66 EWP(k)/EWP(h)/EWT(d)/EWT(m)/EWP(l)/EWP(v)/EWP(t)/ETI IJP(c) JD/HW

ACC NR: AP6021766

SOURCE CODE: UR/0413/66/000/012/0020/0021

INVENTOR: Yezerskiy, K. I.; Korovkin, D. B.; Karsanov, G. V.; Sigalov, Yu. M.; Fedorov, V. A.; Sautin, V. I.

40

B

ORG: none

TITLE: A press for heating and extrusion of metals and alloys in vacuum or a neutral medium. Class 7, No. 182665

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 12, 1966, 20-21

TOPIC TAGS: metal extrusion, hot extrusion, vacuum extrusion, extrusion press, PRESS, VACUUM CHAMBER

ABSTRACT: This Author Certificate introduces a press for heating and extrusion of metals and alloys in vacuum or a neutral medium. The press consists of a vacuum-tight working chamber containing a heating unit, mechanism for feeding ingots, and a container with a die and a dummy block. To improve the efficiency, the press is equipped with compartments for dies, dummy blocks and ingots, with mechanisms for mounting dies and dummy blocks into the container, and with a water-cooled receiving bunker with air lock, all located within the working chamber. The vacuum-tight working chamber is formed by the walls of the press. Orig. art. has: 1 figure. [MS]

SUB CODE: 13/ SUBM DATE: 29Feb64/ ATD PRESS: 5-040

Card 1/1 ⑧

UDC: 621.979:621.777.06-229.6

KOROVKIN, G.

Establishing norms and wages of workers in state trade. Sots.trud.
no.11:66-72 N '56. (MIRA 10:1)

(Retail trade--Production standards)
(Restaurants, lunchrooms, etc.--Production standards)

KOROVKIN, G.

For the welfare of the Soviet people. Obshchestv. pit. no.10:4-6
0 '61. (MIRA 15:1)

1. Zamestitel' nachal'nika ot dela tovarooborota Gosekonomsoveta
SSSR.

(Restaurants, lunchrooms, etc.)

KOROVKIN, G.

Prospective development of public-food service. Sov. torg. 36
no.11:48-53 N '62. (MIRA 16:1)
(Restaurants, lunchrooms, etc.)

KRYLOV, P.N.; MAYYER, V.F.; ZHIDKOVA, M.V.; LAGUTIN, N.S.; KOROVKIN,
G.N.; KIRICHENKO, N.Ya.; AGABAB'YAN, E.M.; KUZ'MINA, Ye.I.;
GALYNSKIY, V.T.; SKRYLEVA, V.N.; GLYAZER, L.S., red.;
RYABOVA, Ye.A., red.; GERASIMOVA, Ye.S., tekhn. red.

[Planning national consumption in the U.S.S.R.; current
problems] Planirovanie narodnogo potrebleniia v SSSR; sov-
remennye problemy. Pod red. V.F. Maiera i P.N. Krylova. Mo-
skva, Izd-vo "Ekonomika," 1964. 134 p. (MIRA 17:1)

1. Moscow. Nauchno-issledovatel'skiy ekonomicheskiy institut.

KOROVKIN, I. F.

23837 O RABOTE NA SHVEINYKH MASHINAKH BEZ KONTROLEROV. POLIGR.
PROIZVODSTVO, 1949, NO. 4, S. 4-6

SO: LETOPIS' NO. 31, 1949

KRISS, Iulius Zhakovich; NOVOSELOV, D.V., retsentent; KOROVKIN, I.F.,
dotsent, retsentent; PEL'TINOVICH, N.G., inzh., red.; TIKHOMIROV,
O.N., red.

[Setting up production standards in the printing industry; a
practical handbook] Tekhnicheskoe normirovaniye v poligrafiyi;
prakticheskoe posobie. Pod obshchey red. N.G.Pel'tinovicha.
Moskva, Gos.izd-vo "Iskusstvo," 1959. 247 p. (MIRA 13:5)
(Printing industry--Production standards)

KOROVKIN, Ivan Petrovich; ZOTOVA, L.A., red.

[Suburban agricultural factories] Sel'skokhoziaistvennye
fabriki prigoroda. Moskva, Znanie, 1964. 46 p. (Novoe v
zhizni, nauke, tekhnike. V Seriiia: Sel'skoe khozisistvo,
no.21) (MIRA 17:11)

KOROVKIN, K.N.; OKS, N.A.; BYLYNA, E.A.; YEVDOKIMOV, V.B.

Magnetic torsion balance. Zhur. fiz. khim. 35 no.3:677-681 Mr '61.
(MIRA 14:3)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova.
(Torsion balance)

ORLOVSKIY, A.; IZMAYLOVA, L.; KOLYADA, I.; KOROVKIN, M.

Semitrailer with a hydraulic drive for the steering of
wheels. Avt.transp. 40 no.3:33-34 Mr '62. (MIRA 15:2)
(Truck trailers)

KOROVKIN, M. A.

Phosphates

Increase in the effectiveness of phosphate fertilizer under the influence of the organic matter in stubble and roots of perennial grasses. Sov. agron. 10 no. 9, 1952.

9. Monthly List of Russian Accessions, Library of Congress, November 1951, Uncl.
2

1. KOROVKIN, M. A.
2. USSR (600)
4. Phosphates
7. Using phosphate fertilizer in preparing organic-mineral composts. Sov. agron., 10,
No. 12, 1952.

9. Monthly List of Russian Accessions, Library of Congress, February 1953, Unclassified.

KOROVKIN, M.A.

[Organic and mineral fertilizers; phosphate mixtures] Organo-mineral'-
nye udobreniya. Moskva, Izd-vo "Znanie," 1954. 23 p. (Vsesoiuznoe ob-
shchestvo po rasprostraneniiu politicheskikh i nauchnykh znanii. Seriya
5, no.4) (Fertilizers and manures) (Phosphates)

(MLRA 7:2)

COUNTRY	: USSR	J
CATEGORY	Soil Science. Fertilizers.	
ABS. JOUR.	RZhBiol., No.4, 1959, № 15421	
AUTHOR	<u>Korovkin, M.A.</u>	
INST.	Moscow Agric.Acad.im. K.A. Timiryazev	
TITLE	Influence of Organic Fertilizers on Increased Effectiveness of Mineral Phosphorus Fertilizers.	
ORIG. PUB.	Izv. Timiryazevsk. s.-kh. akad., 1957, No.5, 25-36	
ABSTRACT	On the basis of the conducted vegetative and field experiments the author believes that compost formation of organic fertilizers with P and apatite intensifies the amount of available P, since P_2O_5 is converted into a more accessible organic form. Addition to the organic-mineral mixture of lime favorably influences the microbiological processes in the soil which are dependent on the greatest accumulation of forms of N and P_2O_5 accessible for plant nutrition.	

Card: 1/2

CHIZHEVSKIY, M.G., doktor sel'skokhozyaystvennykh nauk, prof.; KOROVKIN,
M.A., kand. sel'skokhozyaystvennykh nauk

Effectiveness of liming in acid soils with various amounts of free
aluminum [with summary in English]. Izv. TSKhA no. 3:137-152 '58.
(MIRA 11:?)

(Lime)
(Soil acidity)
(Aluminum)

KOROVKIN, M.A., kand. sel'skokhozyaystvennykh nauk; VITEN, A.F.

Influence of soil tillage and fertilizers on corn and potato crops
outside the chernozem belt. Zemledelie 6 no.2:34-37 '58. (MIRA 11:3)

1. Pochvenno-agronomicheskaya stantsiya imeni akad. V.P. Vill'yamse.
(Corn (Maize)) (Potato)

KOROVKIN, M.A., kand.sel'skokhozyaystvennykh nauk

How the reaction of corn to soil acidity depends on the free aluminum content of soil. Izv. TSKhA no.2:95-104 '60.

(MIRA 14:4)

(Corn (Maize)) (Soil acidity)
(Soils—Aluminum content)

KOROVKIN, M. I., elektromonter

Using a mercury switch in the circuit of a megohmmeter.
Energetik 3 no.5:28-30 My '55. (MIRA 8:8)
(Electric switchgear) (Electric meters)

ANTONOVA, I.G.; KOROVINA, M.V.

Tone and proprioceptive reflexes of cervical muscles. Fiziol. zhur.
46 no.11:1401-1408 N '60. (MIRA 13:11)

1. From the Chair of Normal Physiology, Paediatric Medical Institute,
Leningrad.
(NECK) (REFLEXES)

VARENITSA, YE. T., KOROVKIN, N. N.

Millet

Biology of the flowering and seed development of fox-tail millet. Sel. i sem. 20, No. 3,
1953.

Monthly List of Russian Accessions, Library of Congress, June 1953. Unclassified.

KOROVKIN, P.P.

Ob odnom obobshchenii ryada teylora. Dan, 14 (1937), 479-482.

O polinomakh, ortogonal'nykh po spryamlyuemomu konturu pri nalichii vesa. Matem.
Sb., 9 (51), (1941), 469-488.

SO: Mathematics in the USSR, 1917-1947

Edited by Kurosh, A.G.,

Markusevich, A.I.

Rashevskiy, P.K.

Moscow-Leningrad, 1948

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ure is not indispensable and gives a proof that readability.

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1. THEOREM THE ABSOLUTENESS
OF THE CONVERGENCE OF A SERIES
IN A BANACH SPACE.

Let E be a Banach space and let $\{x_n\}$ be a sequence of vectors in E . If the series $\sum x_n$ converges absolutely in E , i.e., if

$$\lim_{n \rightarrow \infty} \left(\sum_{k=1}^n \|x_k\| \right) = 0,$$

then the series $\sum x_n$ converges in E .

Proof. Let $\epsilon > 0$. Then there exists a positive integer N such that for all $n > N$,

$$\sum_{k=1}^n \|x_k\| < \epsilon.$$

and hence that $\sup_{n > N} \left(\sum_{k=1}^n \|x_k\| \right) = 0$. Since the series of partial sums $\sum_{k=1}^n x_k$ is bounded, it follows that $\sum_{k=1}^n x_k$ is a Cauchy sequence. Hence, since every closed linear subspace of a Banach space is complete, it follows that the series $\sum x_n$ converges in the completion of E , which, in turn, is the given space E .

Source: Mathematical Reviews

Vol. 9 No. 1

Korovkin, P. P. On the growth of polynomials on a set.
Doklady Akad. Nauk SSSR (N.S.) 61, 781-784 (1948).
(Russian)

Let E be a point set in the complex plane and $\{P_n(z)\}$, $n=1, 2, \dots$ a sequence of polynomials with P_n of degree n such that $P_n(z) \rightarrow E$. (1) $\limsup_{n \rightarrow \infty} \|P_n\|^{1/n} = L(E)$ — closure of $L(E)$ — closure of E . For all $\{P_n(z)\}$ satisfying (1) some simple results are stated: $L(E) = 1$ if E contains at least one point; $L(E) = \infty$ if E contains no points. $L(E) = \infty$ if E contains a finite number of points. $L(E) = \infty$ if E contains a finite number of points z_1, z_2, \dots, z_n from E . There is removed a finite number of points z_1, z_2, \dots, z_n from E . Then $L(E - E_i) = L(E)$ if $E_i \subset E$ and $E_i \neq E$, then $L(E) = L(E_i)$. Let F_ϵ be the sum of a countable number of

closed sets. It is proved that (2) $L(E) = \sup L(F_\epsilon)$ for all F_ϵ with $E \subset F_\epsilon \subset E$. This is done by showing separately that (3) $L(E) \leq \sup L(F_\epsilon)$ and (4) $\sup L(F_\epsilon) \leq L(E)$.

Let F_ϵ be a closed set with positive capacity $r(F_\epsilon)$, and let $\{F_\epsilon\}$ be a sequence of closed sets in the regions containing E which contains the point z . Let $g_\epsilon(z)$ be a function $g_\epsilon(z)$ defined everywhere $z \in D(F_\epsilon)$ except at $z \in F_\epsilon$ such that $|g_\epsilon(z)| \leq r(F_\epsilon)$ and $g_\epsilon(z) \rightarrow g(z)$, with $g(z) \geq 0$ in $D(F_\epsilon)$ and $g(z) > 0$ in E . Then $L(g_\epsilon) = e^{-\epsilon r(F_\epsilon)}$ decreases and $L(g_\epsilon) \rightarrow L(g)$ as $\epsilon \rightarrow 0$. Then (5) $L(g_\epsilon) \leq L(g)$. Let $\{F_\epsilon\}$ be a sequence of closed sets in a function of the particular sequence $\{F_\epsilon\}$ used in (5): $F_\epsilon \subset F_\eta$ implies $g_\epsilon(z) \geq g_\eta(z)$ in $D(F_\eta)$; if $E_i \subset F_\eta$, then $L_{E_i}(z) = p_{E_i}(z)$ if and only if $L_{E_i}(z) = p_{E_i}(z)$ in $D(F_\eta)$; if $E_i \subset F_\eta$, then $L_{E_i}(z) = p_{E_i}(z)$ if and only if $L_{E_i}(z) = p_{E_i}(z)$ in $D(F_\eta)$. Hence $L(E) = 0$.

339] if $g_E(s) = g_F(s)$ if and only if E is r -measurable.

Let Γ be the boundary of the region $D(E)$ and Γ' the set of limit points of Γ . Let $\alpha(x) = \limsup_{s \rightarrow x} g_E(s)$ for $x \in \Gamma$, $x \notin D$, and set $\alpha(E) = \max_{x \in \Gamma'} \alpha(x)$, $x \in \Gamma'$. Then $\alpha(E) \leq \log d(E)/r_*(E)$ where $d(E)$ is the diameter of E . If $f(z, E)$ is the polynomial of degree n with leading coefficient c_n having singular points in the set F , that deviates most from zero in the interval $[m, M]$, then $|f(z, E)| \leq c_n r_*(E)^n$ for all z such that $|z - m| \geq r_*(E)$. If $|z - m| < r_*(E)$, then the singular points are too lengthwise away from m so that $|f(z, E)| \leq c_n e^{n(r_*(E))}$, so that $L(E) = e^{\alpha(E)}$. In consequence, if E is a bounded set with positive capacity $r_*(E)$, then $L(E) \leq d(E)/r_*(E) < \infty$. If E is an infinite F -set and $r_*(E) = 0$, then $L(E) = \infty$.

Let D be a region containing the point $z = \infty$, and let Γ be its boundary. Using the definition that the Dirichlet problem is said to have a solution in D if to every function $f(x)$ continuous on Γ there corresponds a function $u_f(z)$ harmonic in D and having the limit value $f(x)$ for points x on the boundary, then it can be shown that: the Dirichlet problem has a solution in D if and only if (i) Γ has no isolated points, and (ii) $L(\Gamma) = 1$. *I. M. Sheffer.*

Source: Mathematical Review

1. KOROVKINA, P. P.
2. USSR (600)
4. Science
7. Introduction to mathematical analysis. Ucheb. posobie dlja ped. in-tov. Ped red. P. P. Korovkina. Moskva, Uchpedgiz, 1951. I. M. Uvarenkov (author)
9. Monthly List of Russian Accessions, Library of Congress, January, 1953. Unclassified.

KOROVKIN, P. P.

184T72

Closed

USSR/Mathematics - Chebyshev's Functions, 11 Jun 51
Closed

"Concerning a Closed System of Chebyshev Functions,"
 P. P. Korovkin, Kalinin State Pedagogic Inst

"Dok Ak Nauk SSSR" Vol LXXVIII, No 5, pp 853-855
 Let function $f_n(x)$ (where $n = 0, 1, 2, \dots$) be continuous on interval (a, b) and such that every polynomial $P_n(x) = \sum_{k=0}^n f_k(x)$ possesses not more than n roots on interval (a, b) . Syst of functions $f_n(x)$ satisfying these conditions just noted is called, following S. N. Bernstein, syst of Chebyshev functions (a T-system). Cf. S. N. Bernstein's "Extremal

184T72

USSR/Mathematics - Chebyshev's Functions, 11 Jun 51
Closed

(Contd)

Properties of Polynomials," 1937 (in Russian).
 Submitted by V. I. Smirnov 17 Mar 51.

184T72

Krovkin

Dokl. Akad. Nauk SSSR
108 (1951).

tic in certain plane whose points $x \in D$, $x \neq z$, are assumed to be a single-valued function $F(x)$ in D . Hence from $\varphi(x)$, where singularity at point z , we get problem. The proof

that $\limsup_{n \rightarrow \infty} u_n$ in D .

Let D be a bounded closed set in E^k , D be continuous complement of D , L be a closed set in E^k , L be continuous, $F: L \rightarrow E$; then exists for each $x \in D$ a function u_x called the k -valued function $F(x)$ in region D relative to L . This function is a sequence of functions u_{xj} , $j = 1, 2, \dots$, $\limsup_{j \rightarrow \infty} u_{xj}$ in D . If $F(x)$ is a single-valued function in the region L , then u_x has one point $u_x = u_{xj}$. In this case, u_x is a continuous function in D .

Krovkin, same

Rev. 10, 297.] A similar

result follows from

 P_k .

Source: Mathematical Reviews,

Vol 13 No. 2

Translation of Title: Unbalanced Equations

Korovkin, P. P. Ungleichungen. Deutscher Verlag der
Wissenschaften, Berlin, 1954. 56 pp.
Translation of the author's "Neravenstva" [Gostehizdat,
Moscow, 1952; these Rev. 14, 24].

KOROVKIN, P. P.

PHASE I

TREASURE ISLAND BIBLIOGRAPHICAL REPORT

AID 302 - I

BOOK

Call No.: 4A43.D34

Authors: DAVYDOV, N. A., KOROVKIN, P. P., NIKOL'SKIY, V. N.

Full Title: COLLECTION OF PROBLEMS ON MATHEMATICAL ANALYSIS

Transliterated Title: Sbornik zadach po matematicheskemu analizu

Publishing Data

Originating Agency: None

Publishing House: State Educational - Pedagogical Publishing House
of the Ministry of Education RSFSR

Date: 1953 No. pp.: 195 No. of copies: 25,000

Editorial Staff

Editor: None

Tech. Ed.: None

Editor-in-Chief: None

Appraiser: None

Others: Prof. Romanovskiy, P. I. and Dotsent Sludskaya-

Zhegalkina, M. I. made the final editing.

Text Data

Coverage: 2412 problems presented are divided into eleven groups,
listed in 66 subgroups and eleven chapters, as shown in
the attached abstracted Table of Contents. Solutions are
given for every individual problem.

The book does not present anything new, but the system

1/2

Sbornik zadach po matematicheskому analizu

AID 302 - I

adopted in the classification of the various problems, as well as some of the individual problems offered seem to be of pedagogical interest.

KOROVKIN, P. P.

USSR/Mathematics - Integro-Differential 21 Jun 53
Eqs

"Convergence of Linear Positive Operators in the
Space of Continuous Functions," P. P. Korovkin,
Kalinin State Pedagog Inst im M. N. Kalinin

DAN SSSR, Vol 90, No 6, pp 961-964

Considers functions $F_n(x, y)$ ($n = 1, 2, \dots$), defined in
the square R ($a \leq x, y \leq b$) and nondecreasing in y for
every fixed x , and the functions $f_n(x) = L_n(f) =$
 $\int_a^b af(y)dF_n(x, y)$. Establishes four theorems gov-
erning the uniform convergence of $L_n(f)$ to a function
 $f(x)$. Presented by Acad V. I. Smirnov 25 Apr 53.

269768

KOROVKIN, Pavel Petrovich; RAZUMOVSKAYA, A.P., redaktor; NEGRIMOVSKAYA,
P.A. [Akademicheskaya] redaktor

[Inequalities] Neravenstva. Izd. 2-e. Moskva, Gos. izd-vo tekhniko-teoret. lit-ry, 1956. 55 p. (Populiarnye lektserii po matematike, no.5) (MLRA 10:2)
(Mathematics)

Korovkin, Pavel Petrovich 4

DAVYDOV, Nikolay Alekseyevich; KOROVKIN, Pavel Petrovich; NIKOL'SKIY,
Vladimir Nikolayevich; OSTIANU, N.M., red.; SMIRNOV, G.I., tekhn.red.

[A collection of problems in mathematical analysis] Sbornik
zadach po matematicheskому analizu. Izd.2-oe. Moskva, Gos.uchebno-
pedagog.izd-vo M-va prosv.RSFSR, 1957. 194 p. (MIRA 11:1)
(Mathematical analysis--Problems, exercises, etc.)

KOROVKIN, P.P. (Moscow)

Existence theorem for a definite integral. Mat. pros.no.2:227-
233 '57. (MIRA 11:?)
(Functional analysis)

AUTHOR: Korovkin, P. P. 20-114-6-6/54

TITLE: On the Order of the Approximation of Functions by Linear Positive Operators (O poryadke priblizheniya funktsiy lineynymi polozhitel'nymi operatorami)

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol. 114, Nr. 6, pp. 1158-1161 (USSR)

ABSTRACT: $\mathcal{L}_n(f;x)$ signifies a linear positive operator whose value for any constant function is an algebraic or trigonometrical polynomial with an order not higher than n . The author here puts down $\Delta_n = \mathcal{L}_n(f;x) - f(x)$. Reference is made to the previous work by Ye. V. Voronovskaya. In the present paper it is shown that the slow tendency of the quantity Δ_n towards zero is true for all linear and positive polynomial operators. Beside that the author furnishes analogy to the equation

$$\lim_{n \rightarrow \infty} n\Delta_n = (1/2)x(1-x)f''(x) \text{ found by E. V. Voronovskaya for any of positive operators.}$$

Card 1/2 Theorem 1: If $\{\mathcal{L}_n(f;x)\}$ is a series of such linear positive

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20-114-6-6/54

On the Order of the Approximation of Functions by Linear Positive Operators

operators where the value of the operator $\mathcal{L}_n(f;x)$ for any constant function on the stretch $-1 \leq x \leq 1$ is an algebraic polynomial of an order not higher than n , at least one of the series $\{n^2\|\mathcal{L}_n(1;x) - 1\|\}$, $\{n^2\|\mathcal{L}_n(t;x) - x\|\}$, $\{n^2\|\mathcal{L}_n(t^2;x) - x^2\|\}$ does not tend towards zero. This theorem is then proved. The order of the approximation of functions by linear positive and polynomial operators is not higher than $1/n^2$, even in the case of analytical functions. Such a statement can also easily be made for the trigonometrical case. The author further reports on series of linear positive and polynomial operators whose order of approximation $1/n^2$ holds for any two-fold-differentiable functions ($\|f''(x)\| < \infty$). There is 1 reference, 1 of which is Slavic.

ASSOCIATION: Moscow Municipal Pedagogical Institute imeni V. P. Potemkin (Moskovskiy gorodskoy pedagogicheskiy institut im. V. P. Potemkina)

PRESENTED: January 1, 1957, by V. I. Smirnov, Member of the Academy
SUBMITTED: December 16, 1956

Card 2/2

KOROVKIN, P.P., prof.

Capacity of a set and the polynomials minimizing the integral.
Uch. zap. Kalin. gos. ped. inst. no.5:34-52 '58. (MIRA 13:10)

1. Kalininskij pedagogicheskiy institut.
(Aggregates)

AUTHOR: Korovkin, P.P.

SOV/42-13-6-11/33

TITLE: On an Asymptotic Property of Positive Methods of Summation for Fourier Series and on the Best Approximation of Functions of the Class Z_2 by Linear Positive Polynomial Operators (Ob odnom asimptoticheskem svoystve polozhitel'nykh metodov summirovaniya ryadov Fur'ye i o nailuchshem priblizhenii funktsiy klassa Z_2 lineynymi polozhitel'nyimi polinomial'nymi operatorami)

PERIODICAL: Uspekhi matematicheskikh nauk, 1958, Vol 13, Nr 6, pp 99-103 (USSR)

ABSTRACT:

Let $u_n(t) = \frac{1}{2} + \sum_{k=1}^n s_k^{(n)} \cos kt \geq 0$ and $L_n(f, x) = \frac{1}{\pi} \int_{-\pi}^{\pi} f(x+t) u_n(t) dt$.

Theorem: In order that $\lim_{n \rightarrow \infty} \frac{L_n(f, x) - f(x)}{L_n(f, x) - \psi(x)} = \frac{D_2 f(x)}{D_2 \psi(x)}$, where

$D_2 f(x) = \lim_{t \rightarrow 0} \frac{f(x+t) - 2f(x) + f(x-t)}{t^2}$, it is necessary and sufficient that $\lim_{n \rightarrow \infty} \frac{1 - s_2^{(n)}}{1 - s_1^{(n)}} = 4$. Let Z_2 be the set of all

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On an Asymptotic Property of Positive Methods of Summation SOV/42-13-6-11/33
for Fourier Series and on the Best Approximation of Functions
of the Class Z_2 by Linear Positive Polynomial Operators

periodic functions for which $|f(x+t) - 2f(x) + f(x-t)| < t^2$.

Let $a_n = \sup_{f \in Z_2} \max_{-\pi \leq x \leq \pi} |L_n(f, x) - f(x)|$ and $b_n = \inf a_n$.

Theorem: $\lim_{n \rightarrow \infty} n^2 b_n = \frac{\pi^2}{2}$.

There are 4 references, 3 of which are Soviet, and 1 Hungarian.

SUBMITTED: July 11, 1957

Card 2/2

16(0)

PHASE I BOOK EXPLOITATION

SOV/3412

Korovkin, Pavel Petrovich

Opredelenny integral i ryady; uchebnoye posobiye dlya pedagogicheskikh institutov (Definite Integral and Series; A Textbook for Pedagogical Institutes) Moscow, Uchpedgiz, 1959. 175 p.
14,000 copies printed.

Ed.: L.G. Nemtsova; Tech. Ed.: V. L. Volchek, and B. N. Golovko.

PURPOSE: This textbook is intended for students in physical-mathematical departments of pedagogical institutes.

COVERAGE: This book discusses problems of mathematical analysis preliminary to the study of the concept of a definite integral. Material covered in the first seven chapters does not differ in substance from the usual content of courses in pedagogical institutes, but it is presented in a somewhat different manner. Thus, for example, the first two chapters discuss the definite integral and its applications without discussing the concept of uniform continuity of a function; Chapter Six discusses the approximate

Card 1/6

Definite Integral and Series (Cont.)

SOV/3412

computation of integrals without discussing the concept of an interpolation polynomial. The final two chapters treat elements of the approximation theory and Fourier series. The author thanks Professor A. I. Markushevich and Docent N. A. Frolov. No references are given.

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PHASE I - HIGH EXPLOITATION

SOV/2759

Korovkin, Pavel Petrovich

Lineynyye operatory i teoriya priblizheniy (Linear Operators and the Theory of Approximations) Moscow, Fizmatgiz, 1959. 211 p. 9,000 copies printed.

Ed.: V.S. Videnskiy; Tech. Ed.: V.N. Kryuchkova.

PURPOSE: This book is intended as a textbook on the constructive theory of functions for students with the background in mathematical analysis required in the divisions of physics and mathematics pedagogical institutes.

COVERAGE: In the book a study is made of the direct and converse problems of the theory of the approximation of functions by polynomials (theorems of Jackson and S. N. Bernstein) and the order of the approximation of functions by linear positive operators is evaluated. Nonpositive linear continuous polynomial operators are also studied. Separate chapters are devoted to Fourier series and to interpolation by polynomials. At the end of certain chapters are found additional theorems and problems. The author thanks Professor S.M. Lozinskiy, I.P. Natanson and the editor, V.S. Vindenskiy, for

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APPROVED FOR RELEASE: 06/14/2000
Linear Operators (Cont.)

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valuable comments and criticisms concerning the book, as well as his teacher, Vladimir Ivanovich Smirnov, for his close attention to the author's work.
There are no references.

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APPROVED FOR RELEASE: 06/14/2000
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67069

SOV/44-59-9-9272

16(+) 16.4600

Translation from: Referativnyy zhurnal Matematika, 1959, Nr 9, p129 (USSR)

AUTHOR: Korovkin, P.P.

TITLE: On the Conditions for the Uniqueness of the Momentum Problem and
for the Convergence of a Sequence of Linear Operators

PERIODICAL: Uch. zap. Kalininsk. gos. ped. in-ta, 1959, 26, 95-102

ABSTRACT: The principal results of the paper are contained in the theorems:

Theorem 3: If 1) the operator

$$L_\alpha(f, x) = \int_a^b f(y) d\alpha(x, y)$$

(where $\int_a^b |d_y \alpha(x, y)| \leq s (< \infty)$ for every $x \in [a, b]$) is determined uniquelyby its values on the set $\tilde{H} \subset H \subset C_{[a, b]}$; 2) for $f \in H$ the function $L_\alpha(f, x)$
is continuous in $[a, b]$; 3) the sequence of functions $L_{\alpha_n}(f, x)$, where

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On the Conditions for the Uniqueness of the Momentum Problem and for the Convergence of a Sequence of Linear Operators

system, then the sequence $L_{\alpha_n}(f, x)$ converges uniformly to $f(x)$ if $f(x) \in C_{[a, b]}$.

Remark of the reviewer: M.G.Kreyn (Uspekhi matem.nauk, 1951, 6, vyp 4, p 48 and 77) has proved (in a more general form) that the conditions of the theorem 1 and 2 are sufficient.

A.A.Nudel'man

X

Card 3/3

16(1)

AUTHOR:

Korovkin, P.P.

SOV/20-127-3-8/71

TITLE: On the Best Approximation of Z_2 Functions by Some Linear
Operators

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 127, Nr 3, pp 513-515 (USSR)

ABSTRACT:

Let the series $\sum_{k=2}^{\infty} \psi_k(r)$ converge absolutely for $0 < r < 1$. Let

$$u_r(t) = \frac{1}{2} + r \cos t + \sum_{k=2}^{\infty} \psi_k(r) \cos kt$$

$$L_r(f, x) = \frac{1}{\pi} \int_{-\pi}^{\pi} f(x + t) u_r(t) dt$$

Let Z_2 be the class of the periodic functions for which
 $|f(x+t) + f(x-t) - 2f(x)| \leq t^2$. Let :

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On the Best Approximation of Z_2 Functions by Some
Linear Operators.

SOV/20-127-3-8/71

$$a_r = \sup_{f(x) \in Z_2} \max_{-\pi \leq x \leq \pi} |L_r(f, x) - f(x)| \text{ and } b_r = \inf a_r$$

in dependence of the choice of $u_r(t)$ (i.e. of the choice of
 $\{\psi_k(r)\}$).

$$\text{Theorem : It is } \lim_{r \rightarrow 1} \frac{b_r}{1-r} = 1$$

$$\text{Theorem : It is } \lim_{r \rightarrow 1} \frac{a_r}{1-r} = \frac{2}{\sqrt{\pi}}$$

There are 3 Soviet references.

ASSOCIATION: Moskovskiy gorodskoy pedagogicheskiy institut imeni V.P.
Potemkina (Moscow Municipal Pedagogical Institute imeni V.P.
Potemkin)

PRESENTED: April 6, 1959, by V.I. Smirnov, Academician

SUBMITTED: April 1, 1959

Card 2/2

66719

16(1) 16,260°

AUTHOR: Korovkin, P.P.

SOV/20-129-2-4/66

TITLE: Capacity of a Set and Singular Functions

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 129, Nr 2, pp 250-253 (USSR)

ABSTRACT: Let $\varphi(x)$ be a nondecreasing singular function on $[-1, 1]$,
 $m\{\varphi'(x)\} = 0$. Let $\beta_0 = -1 < \alpha_1 < \beta_1 < \dots < \beta_n < \alpha_{n+1} = 1$, $A_n =$

$$= \sum_{k=1}^n [\alpha_k, \beta_k], \quad B_n = \sum_{k=0}^n [\beta_k, \alpha_{k+1}]. \quad \text{Let } 0 < m A_n = q < 2 \text{ and}$$

$$(1) \quad \inf_{mA_n=q} \int_{B_n} d\varphi(x) = \Delta_n(q).$$

It holds $\Delta_n(q) \rightarrow 0$ with $n \rightarrow \infty$. Consider all sets A_n , the capacity (transfinite diameter) of which is $c(A_n) =$
 $= q < c([-1, 1]) = \frac{1}{2}$, and put

$$(2) \quad \inf_{c(A_n)=q} \int_{B_n} d\varphi(x) = \delta_n(q).$$

Card 1/2 The author proves the existence of singular functions, for ✓

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which the sequence of the $\delta_n(q)$ is bounded from below by a positive number, if $q < \frac{1}{2}$. The theorem does not hold, if $\varphi(x)$ is a step function. The proof is based on two lemmata. There is 1 Soviet reference.

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AUTHOR: Korovkin, P. P.
TITLE: Asymptotic Properties of Positive Methods of Summation
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ABSTRACT: Let $\varphi(x)$ be defined on the interval $(0,1)$ and

$$u_n(t) = \left| \sum_{k=0}^n \varphi\left(\frac{k}{n}\right) e^{ikt} \right|^2 \frac{1}{2A_n}, \quad (1)$$

where $A_n = \sum_{k=0}^n \varphi^2\left(\frac{k}{n}\right) \neq 0$.

$$\text{Let } L_n(f, x) = L_{n, \varphi}(f, x) = \frac{a_0}{2} + \sum_{k=1}^n \varphi_k^{(n)} (a_k \cos kx + b_k \sin kx), \quad (4)$$

Card 1/5 where a_k and b_k are the Fourier coefficients of $f(x)$

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Theorem 1: If $\varphi(x)$ is Riemann integrable and $\int_0^1 \varphi^2(x) dx > 0$ then the sequence of operators $L_n(f, x)$ converges uniformly to $f(x)$ if $f(x) \in C_2\mathbb{W}$.

Let Z be the class of periodic functions for which the inequality $|f(x+h) + f(x-h) - 2f(x)| < 2|h|$ holds for all x and h .

Let $c_n = \sup_{f(x) \in Z} \|L_n(f, x) - f(x)\|$.

Theorem 2: If $\varphi(x)$ is bounded, $|\varphi(x)| \leq M$ and $\varphi^2(x) + \varphi^2(1-x) \geq \lambda > 0$, $0 \leq x \leq \delta$ then

$$c_n \geq \frac{c \ln n}{n} + O\left(\frac{1}{n}\right), \quad c > 0. \quad (5)$$

Thus the poor approximation of functions of class Z holds not only for the Fejer operators $F_n(f, x)$ ($\varphi(x) = 1$)

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but also for the operator $L_{n,\rho}$ (f,x) if

$$\lim_{x \rightarrow 0} [\varphi^2(x) + \varphi^2(1-x)] > 0.$$

Theorem 3: If the continuous function $\varphi(x)$ has bounded variation and $\varphi^2(0) + \varphi^2(1) \geq 0$ then

$$\lim_{n \rightarrow \infty} n(1 - Q_n^{(m)}) = \frac{k(\varphi^2(0) + \varphi^2(1))}{2 \int_0^1 \varphi^2(x) dx}, \quad (10)$$

$$\lim_{n \rightarrow \infty} \frac{n}{\ln n} b_n = \frac{\varphi^2(0) + \varphi^2(1)}{\pi \int_0^1 \varphi^2(x) dx}. \quad (11)$$

Theorem 4: If the periodic function $f(x)$ is bounded at x and has one-sided derivatives, then

$$A_n - A_{k,n} = \frac{k}{2} \left\{ \varphi^2(0) + \varphi^2(1) + o(1) \omega\left(\frac{k}{n}\right) \right\}$$

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if only the function $\varphi(x)$ satisfies the conditions of theorem 3. Now consider the case for which $\varphi(0) = \varphi(1) = 0$. Of such type are the Jackson operators for which $\varphi(x) = 1 - 2 / |x - 1/2|$

Theorem 5: Let $\varphi(x)$ be continuous in the interval $(0, 1)$ and equal to zero at the end points. Assume that $\varphi'(x)$ exists everywhere in the interval except at most for some finite number of points, and that $\varphi'(x)$ is Riemann integrable. Then

$$\lim_{n \rightarrow \infty} n^2 (1 - \varrho_n^{(m)}) = \frac{1}{2} \frac{\int_0^1 \varphi''(x) dx}{\int_0^1 \varphi'(x) dx}. \quad (20)$$

Corollary: If the conditions of theorem 5 are satisfied and $f(x)$ has generalized second derivative at point x , $D_2 f(x) < \infty$, then

$$L_n(f, x) - f(x) = D_2 f(x) (1 - \varrho_n^{(m)}) + o(1 - \varrho_n^{(m)}). \quad (21)$$

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